VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 15, 2009

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 09-034
NL&OS/ETS R0
Docket Nos. 50-338/339
License Nos. NPF-4/7

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED LICENSE AMENDMENT REQUEST
TS 3.7.12 – ECCS PUMP ROOM EXHAUST AIR CLEANUP SYSTEM (PREACS)
ADDITION OF CONDITIONS/ACTION STATEMENTS

Pursuant to 10 CFR 50.90, Dominion requests amendments, in the form of changes to the Technical Specifications to Facility Operating License Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed changes will add new Conditions B and C with associated Action Statements and Completion Times to TS 3.7.12. The changes specifically address the filtration function of ECCS PREACS and will be more consistent with the associated design and licensing basis accident analysis assumptions.

Attachment 1 provides a discussion of and the basis for the proposed amendments. The marked-up and proposed Technical Specifications pages are provided in Attachments 2 and 3, respectively. The associated marked-up Bases changes are provided in Attachment 4 for information only and will be implemented in accordance with the Technical Specification Bases Control Program.

The proposed changes have been reviewed and approved by the Facility Safety Review Committee.

Dominion requests approval of the license amendments by January 31, 2010 with a 60-day implementation period following NRC approval of the license amendments.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the appropriate designated officials of Virginia.

If you have any questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,

W R Matthews

William R. Matthews
Senior Vice President – Nuclear Operations

Attachments

1. Discussion of Change
2. Marked-up Technical Specifications Changes
3. Proposed Technical Specifications Pages
4. Marked-up Technical Specifications Bases Changes

Commitments made in this letter: None.

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by William R. Matthews, who is Senior Vice President – Nuclear Operations, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 15TH day of January, 2009.

My Commission Expires: May 31, 2010.

VICKI L. HULL
Notary Public
Commonwealth of Virginia
140542
My Commission Expires May 31, 2010

Vicki L. Hull
Notary Public

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

Mr. J. E. Reasor, Jr.
Old Dominion Electric Cooperative
Innsbrook Corporate Center
4201 Dominion Blvd.
Suite 300
Glen Allen, Virginia 23060

State Health Commissioner
Virginia Department of Health
James Madison Building - 7th floor
109 Governor Street
Suite 730
Richmond, Virginia 23219

NRC Senior Resident Inspector
North Anna Power Station

Mr. J. F. Stang, Jr.
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O-8 G9A
11555 Rockville Pike
Rockville, Maryland 20852-2738

Ms. D. N. Wright
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O-8 H4A
11555 Rockville Pike
Rockville, Maryland 20852-2738

Attachment 1

(Serial No. 09-034)

Discussion of Change

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)

Discussion of Change

1.0 Introduction

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company (Dominion) requests an Amendment to Facility Operating License Numbers NPF-4 and NPF-7 in the form of changes to the Technical Specifications (TS) for North Anna Power Station Units 1 and 2. The proposed changes will add new Conditions B and C with associated Action Statements and Completion Times to TS 3.7.12 "Actions" to specifically address the filtration function of ECCS PREACS and to be more consistent with the associated design and licensing basis accident analysis assumptions.

TS 3.7.12 addresses the Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS) operability requirements. This ventilation system consists both of unit-specific subsystems (Unit 1 and Unit 2 Safeguards Exhaust), a shared subsystem (Auxiliary Building Central Exhaust), and the associated common ductwork. The system is operated both during normal operations and during accident conditions. The system is connected to several other subsystems which are shutdown and isolated during an accident which results in an ECCS actuation.

The current Technical Specifications are overly restrictive when considering the current design analysis. The design analysis includes consideration of ECCS leakage in the determination of primary ventilation filtration requirements. However, TS requirements do not include consideration of low ECCS leakage and are therefore overly restrictive. The filtration requirements are stipulated in the Technical Specification Ventilation Filter Testing Program and include particulate filtration and charcoal adsorption capabilities, system bypass leakage, etc. Therefore, when "filtration" or "filters" are used in this document it includes both particulate filtration and gaseous adsorption.

The proposed changes qualify for categorical exclusion from an environmental assessment as set forth in 10 CFR 51.22(c)(9). Therefore, no environmental impact statement of environmental assessment is needed in connection with the approval of the proposed changes.

2.0 Proposed Changes

The proposed changes will modify Condition A and add new Conditions B and C with associated Action Statements and Completion Times to TS 3.7.12.

- Condition A is being modified to remove the filtration function from the operability requirements of a PREACS train. The actions addressing the ventilation exhaust function of ECCS PREACS remain unchanged.
- The proposed two new Conditions (B and C) with Actions and Completion Times will address the operability of the filtration function of ECCS PREACS only.
- The Remaining Conditions are renumbered due to the addition of the two new Conditions.

The new Actions are provided on the next page.

PROPOSED ACTIONS FOR TS 3.7.12

(bold/italicized indicate changes)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECCS PREACS train inoperable ***for reasons other than Condition B.***	A.1 Restore ECCS PREACS train to OPERABLE status.	7 days
B. One ECCS PREACS train inoperable due to inoperable filtration capability.	***B.1.1 Verify ECCS leakage is less than the maximum allowable unfiltered leakage.***	***1 hour AND Once per 24 hours thereafter***
	AND	
	B.1.2 Restore ECCS PREACS train to OPERABLE status.	***60 days***
	OR	
	B.2 Restore ECCS PREACS train to OPERABLE status.	***7 days***
C. Two ECCS PREACS trains inoperable due to inoperable filtration capability.	***C.1 Verify ECCS leakage is less than the maximum allowable unfiltered leakage.***	***1 hour AND Once per 24 hours thereafter***
	AND	
	C.2 Restore at least one ECCS PREACS train to OPERABLE status.	***30 days***
D. Two ECCS PREACS trains inoperable due to inoperable ECCS pump room boundary.	***D.1*** Restore ECCS pump room boundary to OPERABLE status.	24 hours
E. Required Action and associated Completion Time not met.	***E.1*** Be in MODE 3.	6 hours
	AND	
	E.2 Be in MODE 5.	36 hours

TS Bases B 3.7.12 are being modified to incorporate the basis for the new Conditions and are included for information. The Bases changes will be incorporated into the TS in accordance with the Bases Control Program after NRC approval of the proposed TS changes.

3.0 Background

Design/Licensing Bases

The Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS) filters potentially radioactive air from the area of the active ECCS components during the recirculation phase of a loss of coolant accident (LOCA). The ECCS PREACS, in conjunction with other normally operating ventilation systems, also provides environmental control of temperature in the ECCS pump room areas.

During emergency operations, the ECCS PREACS dampers are realigned to begin filtration through charcoal adsorbers. Specifically, the charcoal adsorber assembly adsorbs radioiodines before releasing the remaining exhaust air to the environment. The existing accident analyses assume that filtration by ECCS PREACS does not begin for 60 minutes following an accident, as reflected in the current TS Bases Section B 3.7.12 Applicable Safety Analyses.

The design basis for ECCS PREACS is to maintain both off-site radiation dose and radiation dose to the Control Room operators within the allowable limits, as stated in UFSAR Chapters 12 & 15. The charging/high head safety injection pump motors have internal fans that provide design cooling requirements without reliance on the central exhaust fans. The safeguards building has sufficient cooling capability to ensure the associated equipment, Low Head Safety Injection (LHSI) and Outside Recirculation Spray (OSRS) pumps, remain operable for 60 minutes without the safeguards exhaust fans in service, which is consistent with the accident analysis assumptions.

The licensing basis for ECCS PREACS is for the system to be operating within 60 minutes following an accident, and to be capable of providing filtration efficiencies as stated within Technical Specifications Sections 3.7.12 and 5.5.10.

An engineering evaluation was initiated due to entry into Tech Spec 3.0.3 on August 29, 2007 when Unit 2 Safeguards Bypass dampers 2-HV-AOD-228-1 & -228-2 were found to have excessive leak-by. One of the contributing causes to entry into TS 3.0.3 identified by the evaluation determined that the Technical Specifications are more restrictive than the design analysis. The design analysis supports consideration of ECCS leakage for primary ventilation filtration requirements; however, TS requirements do not address consideration of low ECCS leakage and are therefore more restrictive.

4.0 Technical Analysis & Safety Considerations

To meet the design basis requirement to maintain both off-site radiation dose and radiation dose to the Control Room operators within the allowable limits, the analyses for one accident (large break LOCA) take credit in certain circumstances for filtration by ECCS PREACS. This filtration may be needed when ECCS is placed into the recirculation mode of long-term cooling to accommodate airborne radiation from potential water leakage from ECCS components (i.e., "ECCS leakage"). If the ECCS leakage is less than a specific calculated value, then dose calculations show that ECCS PREACS is not required, and both off-site radiation dose and radiation dose to the Control Room operators will be maintained within the allowable limits.

The amount of ECCS leakage is an operating parameter that is periodically monitored by Operations as follows: a) the amount of ECCS leakage located within the ECCS pump rooms, and b) the amount of ECCS leakage located outside of the ECCS pump rooms. The air within the ECCS pump rooms is exhausted by the ECCS PREACS and is aligned to the filters post-accident; therefore, a larger amount of ECCS leakage can be accommodated in these rooms. Dose calculations determined the maximum amount of ECCS leakage that can be accommodated both in the pump rooms (filtered) and remaining areas (unfiltered). This relationship is shown in UFSAR Figure 15.4-110. If all measured ECCS leakage is assumed to be located within unfiltered areas, and if the total is less than the calculated value for maximum allowable unfiltered leakage as documented in UFSAR Figure 15.4-110, then radiation dose will be maintained within allowable limits without filtration.

Procedures which address monitoring of ECCS leakage include provisions such that the leakage measurement will be adjusted by conservative calculation to reflect the accident conditions (i.e., higher leakage due to higher system operating pressure). Therefore, there is assurance that actual leakage during an accident will be the same as the operating parameter of ECCS leakage identified prior to the accident.

There is an adequate margin of safety provided for the comparison between the operating parameter of ECCS leakage to the maximum allowable unfiltered leakage. Dose calculations include several conservatisms, including the fact that the ECCS leakage rate is increased in the calculation by a factor of two above its operating limit.

There are several potential sources for ECCS leakage, such as charging pump (high head safety injection pump) seals, valve packing, or valve body-to-bonnet; however, pump seals are typically the highest source. Review of the operating history of the ECCS components during the past five years indicates that individual components have had calculated leakage greater than 1700 cc/hr on only five occasions, and each was repaired within the next day (valve packing on 10/20/03, and pump seals on 10/27/04 and 11/6/04 for Unit 1 and on 7/29/04 and 1/3/05 for Unit 2). The station's charging pump seals historically had an issue with excessive leakage which was subsequently resolved through modification and improved procedures.

Review of the ECCS leakage log indicates that total leak rate (after calculated adjustment to accident conditions) since 2003 is typically less than 500 cc/hr. This includes all

leakage, both in areas with unfiltered ventilation and in areas served by ECCS PREACS, and is well below the value for maximum allowable unfiltered leakage of 1700 cc/hr, as documented in UFSAR Figure 15.4-110. For example, the total ECCS leakage on May 1, 2008 in Unit 1 was 366 cc/hr and in Unit 2 was 310 cc/hr. The largest single leak rate in the past year resulted in 381 cc/hr calculated leakage.

Though minor, charging pump seal leakage after a pump has been secured during swapping of the operating pump has been the predominant leakage source observed. However, during a LOCA event the pumps are running, which would minimize the potential for seal leakage. Also, it is unlikely that an event which leads to the LOCA inside Containment will also directly cause an increase in leakage of the ECCS components, since the ECCS components are located outside of containment. For these reasons, the probability of having ECCS leakage above 1700 cc/hr during a LOCA is considered to be low.

As part of our GSI-191 initiative, an evaluation was completed for the mechanical seal assembly of the North Anna charging pumps (HHSI), Low Head Safety Injection (LHSI) Pumps and outside Recirculation Spray (OSRS) Pumps to confirm that DBA-generated debris will not be a mechanism to cause mechanical seal leakage in excess of acceptable limits.

The tandem seal design of the LHSI and OSRS pumps minimizes the probability of DBA-generated debris from entering between the seal faces. In particular, clean water sources are supplied to an annular volume between the inboard and outboard seals, which will minimize the possibility of debris laden process water entering between the seal faces. Therefore, this seal configuration prevents excessive pump seal wear and ensures there is no significant impact on pump flow or seal leakage.

Independent evaluations, completed by Westinghouse and MPR Associates Inc., confirmed that the performance of the HHSI pump mechanical seals will not be affected by debris-laden water from the containment sump in a post loss-of-coolant-accident (LOCA) environment. Using debris loading data from the North Anna GSI-191 initiative, it was shown that the debris is too large to pass through the primary seal and cause wear and that no sizeable amount of debris will be entrained in the fluid flushing the seals due to the flushing fluids low velocity. In addition, the low concentration of debris reduces the possibility of the debris interfering with the seal springs. Also, the seal is a pusher design with a secondary seal (o-ring) that is protected from debris. The seal design features are adequate to prevent fouling with low debris concentrations in the pump fluid. Lastly, even assuming that the seal has a pre-existing leak that allows debris to enter the seal, the seal wear rate was evaluated and it was confirmed that the wear would be significantly less than the acceptable limit, and the seal would survive for the required mission time.

For these reasons, the evaluations show that debris would not be expected to be a failure mechanism for the mechanical seal assemblies in the charging pumps, LHSI pumps, or OSRS pumps and the pumps will perform their design basis functions during the 30-day mission time, without a significant increase in ECCS leakage due to pump seal failure.

Basis for New Actions and Completion Times

There are several conditions which could affect filtration function but not affect the cooling function of ECCS PREACS. For example, a problem with the filter or charcoal adsorber or their housing would just affect a single train. In this case, the two trains remain operable to perform the cooling function using either the flow path of the remaining filter or the flow path of the bypass ductwork. However, a problem with leak-by through the bypass dampers, or with control of the filter & bypass dampers, on one of the subsystems would affect the filtration capability of both trains. Bypass leak-by requires a significant time to identify the source of the issue, get it resolved, and perform required leak testing.

With one ECCS PREACS train inoperable due to loss of its filtration capability, action must be taken within one hour to determine if the filtration capability is required. This is determined based on comparing the ECCS system operational leakage versus design basis assumptions. If the current total ECCS leakage is less than the maximum allowable unfiltered leakage assumed in the design bases, then the filtration capability of ECCS PREACS is not required.

The proposed actions to restore the inoperable train's filtration function to operable status within sixty days are reasonable, consistent with (a) the low probability of an increase in ECCS leakage to greater than the maximum allowable unfiltered leakage based on past ECCS leakage history, (b) the other train of ECCS filtration remaining operable to perform its intended safety function if needed, (c) the margin that exists between operating limits and actual dose limits, and (d) the low probability of a DBA during this time. During this time, both trains remain operable to perform the ventilation exhaust function. In addition, the proposed change includes administrative controls that require operating parameters to be monitored every 24 hours in order to determine whether or not filtration capability is required. Establishing monitoring on a 24 hour frequency is based on the low probability of a sudden change in ECCS leakage and the conservatisms in the design basis dose calculations.

If total ECCS leakage is equal to or greater than the maximum allowable unfiltered leakage limit then the filtration capability of ECCS PREACS is required and actions must be taken to restore Operability of the filter within 7 days consistent with an inoperable PREACS train for any other reason.

If two ECCS PREACS trains are inoperable due to loss of their filtration capability, the proposed change requires action to be taken within one hour to determine if the filtration capability is required. This is determined based on the Unit's operational ECCS leakage. If the current total ECCS leakage is less than the maximum allowable unfiltered leakage, then the filtration capability of ECCS PREACS is not immediately required and an extended period to restore operability can be applied.

Actions to restore the filtration function and restore an inoperable train to operable status within thirty days are reasonable, consistent with (a) the low probability of an increase in ECCS leakage to greater than the maximum allowable unfiltered leakage based on past ECCS leakage history, (b) the margin that exists between operating limits and actual dose

limits, and (c) the low probability of a DBA during this time. During this time, both trains remain operable to perform the ventilation exhaust function.

In addition, the proposed changes include administrative controls that require operating parameters be monitored every 24 hours in order to determine whether or not filtration capability is required. Establishing monitoring on a 24 hour frequency is based on the low probability of a sudden change in ECCS leakage, and on the conservatism included in the design basis dose calculations.

5.0 Regulatory Safety Analysis

No Significant Hazards Consideration

The proposed changes will add new Conditions B and C with associated Action Statements and Completion Times to TS 3.7.12 to specifically address the filtration function of ECCS PREACS and to be more consistent with the associated design analysis. Dominion has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment" as discussed below:

1. Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed changes do not adversely affect accident initiators or precursors and do not alter the design assumptions, conditions, or configuration of the facility. The new conditions only affect the filtration function of ECCS PREACS, which is an accident mitigation function, so accident initiation probability is not impacted. Regarding significance of the proposed changes relative to the accident consequences, the new conditions remain consistent with existing design assumptions (i.e., dose calculations show that the filtration function is not required when ECCS leakage is less than the maximum allowable unfiltered leakage) and filtration is required to be operable as required to support the design analysis assumptions.

   Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   The addition of the new Conditions B and C with associated Action Statements and Completion Times to TS 3.7.12 to address the filtration function of ECCS PREACS does not impact the accident analysis or associated assumptions. The new conditions only address actions to be taken when portions of ECCS PREACS (an accident mitigation system) is out-of-service.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   The proposed changes do not alter the manner in which safety limits, limiting safety system settings, or limiting conditions for operation are determined. The proposed new conditions recognize that there may be limited leakage situations when filtration is not required to meet the accident analysis assumptions. Allowing safety equipment to be inoperable while it is not required is not reducing the analyzed margin of safety.

   Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the above, Dominion concludes that the proposed changes represent no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

Regulatory Requirements

The proposed changes will add new Conditions B and C with associated Action Statements and Completion Times to TS 3.7.12 to specifically address the filtration function of ECCS PREACS and to be more consistent with the associated design analysis. The filtration function of ECCS PREACS serves to limit both on-site and off-site dose. As described in UFSAR Chapter 15, the only accident in which ECCS PREACS is credited is the Loss-of-Coolant Accident. UFSAR Section 15.4.1.8.8 shows that calculated dose results for both on-site and off-site are less than the regulatory limits of 10CFR50.67 and of GDC 19. Since the proposed changes will add new conditions that require ECCS leakage to be within the limits established in UFSAR Chapter 15 assuming no credit for ECCS PREACS filtration, it is concluded that the proposed changes comply with all regulatory requirements.

General Conformance with General Design Criteria (GDC)

North Anna was originally designed to meet the draft GDC published in 1967. Construction permits for Units 1 and 2 were issued on February 19, 1971. The GDC, Appendix A to 10 CFR 50, were published February 20, 1971. Dominion attempted to comply with the intent of the newer criteria to the extent practical, recognizing previous design commitments. As a result, the NRC review assessed the plant design against the GDC published in 1971 and concluded that the design conformed to the newer criteria. The North Anna Safety Evaluation Report (NUREG-0053) was issued in June 1976.

Criterion 19 - Control Room

The control room habitability systems include radiation shielding, redundant emergency air filtering and air conditioning systems, radiation monitoring, lighting, and fire protection equipment.

The North Anna control room is common to both units. Sanitary facilities and potable water are located in the control room, and food can be brought to the control room as needed. Radiation protection is provided by shielding (walls and slabs), radiation monitoring, emergency filtration, and separate and independent control room isolation and pressurization systems.

The control room is designed to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions. Adequate radiation protection has been provided to ensure that radiation exposures to personnel occupying the control room during the 30-day period following a DBA will not exceed 5 rem Total Effective Dose Equivalent (TEDE).

Evaluations of the LBLOCA and Fuel Handling accidents, using Alternate Source Term, demonstrate that North Anna meets the GDC 19 criterion of 5 rem TEDE, with unfiltered inleakage into the control room envelope at 250 cfm for LOCA and 400 cfm for fuel handling accident of unfiltered inleakage. A submittal of DBA analyses using the AST methodology was approved by the NRC on June 15, 2005 in amendments 240 and 241 for North Anna Units 1 and 2, respectively. The Large Break LOCA is the limiting radiological event. The design basis accidents, dose analyses, and consequences are described in Chapter 15 of the UFSAR.

The proposed change to the TS will ensure that compliance with requirements equivalent to 10 CFR 50, Appendix A, GDC 19 is maintained. Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

6.0 Environmental Assessment

This amendment request meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) as follows:

(i) The amendment involves no significant hazards consideration.

As described above in Section 5.0, the proposed changes involve no significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released off-site.

The proposed changes do not involve the installation of any new equipment, or the modification of any equipment that may affect the types or amounts of effluents that may be released off-site. Therefore, there is no significant change in the types or significant increase in the amounts of any effluents that may be released off-site.

(iii) There is no significant increase in individual or cumulative occupation radiation exposure.

The proposed changes do not involve physical plant changes. Therefore, there is no significant increase in individual or cumulative occupation radiation exposure. Although the new conditions may lead to an increase relative to the current practice in the dose consequence of an accident (if an accident were to occur while the system is in an action statement), the effect is not adverse in that dose will still be well within the design and licensing limits.

Based upon the above, Dominion concludes that the proposed changes meet the criteria specified in 10 CFR 51.22 for a categorical exclusion from the requirements of 10 CFR 51.22 relative to requiring a specific environmental assessment by the Commission.

7.0 Conclusion

This evaluation demonstrates that the proposed changes to the Technical Specifications and the Bases are appropriate. The ECCS PREACS remains capable of performing its intended safety function.

8.0 References

The following references support the accuracy of the proposed Technical Specifications and Bases changes and the evaluation in this document:

1. Technical Specifications (TS), Section 3.7.12, Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS), Amendments 231/212
2. Technical Specifications Bases, Section B 3.7.12, Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS), Revision 20.
3. UFSAR Section 9.4.8, "Auxiliary Building HEPA/Charcoal Filter Loops"
4. UFSAR Section 12.2, "Ventilation"
5. UFSAR Section 15.4.1, "Loss of Reactor Coolant From Ruptured Pipes or From Cracks in Large Pipes Including Double Ended Rupture That Actuates the Emergency Core Cooling System (Large Break Loss of Coolant Accident)"

Attachment 2

(Serial No. 09-034)

Marked-up Technical Specifications Changes

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)

3.7 PLANT SYSTEMS

3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

LCO 3.7.12 Two ECCS PREACS trains shall be OPERABLE.

- - - - - - - - - - - - - - NOTE - - - - - - - - - - - - - -
The ECCS pump room boundary openings not open by design may be opened intermittently under administrative control.
- -

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECCS PREACS train inoperable for reasons other than Condition B.	A.1 Restore ECCS PREACS train to OPERABLE status.	7 days
~~B.~~ D. Two ECCS PREACS trains inoperable due to inoperable ECCS pump room boundary.	B.1 Restore ECCS pump room boundary to OPERABLE status.	24 hours
~~C.~~ E. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

INSERT A

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each ECCS PREACS train for ≥ 10 continuous hours with the heaters operating.	31 days

Insert A -New PREACS Conditions, Actions, and Completion Times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One ECCS PREACS train inoperable due to inoperable filtration capability.	*B.1.1 Verify ECCS leakage is less than the maximum allowable unfiltered leakage.*	*1 hour* *AND* *Once per 24 hours thereafter*
	AND	
	B.1.2 Restore ECCS PREACS train to OPERABLE status.	*60 days*
	OR	
	B.2 Restore ECCS PREACS train to OPERABLE status.	*7 days*
C. Two ECCS PREACS trains inoperable due to inoperable filtration capability.	*C.1 Verify ECCS leakage is less than the maximum allowable unfiltered leakage.*	*1 hour* *AND* *Once per 24 hours thereafter*
	AND	
	C.2 Restore at least one ECCS PREACS train to OPERABLE status.	*30 days*

Attachment 3

(Serial No. 09-034)

Proposed Technical Specifications Changes

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)

3.7 PLANT SYSTEMS

3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

LCO 3.7.12 Two ECCS PREACS trains shall be OPERABLE.

- - - - - - - - - - - - - - NOTE - - - - - - - - - - - - - - -
The ECCS pump room boundary openings not open by design may be opened intermittently under administrative control.
- -

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECCS PREACS train inoperable for reasons other than Condition B.	A.1 Restore ECCS PREACS train to OPERABLE status.	7 days
B. One ECCS PREACS train inoperable due to inoperable filtration capability.	B.1.1 Verify ECCS leakage is less than the maximum allowable unfiltered leakage.	1 hour AND Once per 24 hours thereafter
	AND	
	B.1.2 Restore ECCS PREACS train to OPERABLE status.	60 days
	OR	
	B.2 Restore ECCS PREACS train to OPERABLE status.	7 days

ACTIONS

C. Two ECCS PREACS trains inoperable due to inoperable filtration capability.	C.1	Verify ECCS leakage is less than the maximum allowable unfiltered leakage.	1 hour AND Once per 24 hours thereafter
	AND		
	C.2	Restore at least one ECCS PREACS train to OPERABLE status.	30 days
D. Two ECCS PREACS trains inoperable due to inoperable ECCS pump room boundary.	D.1	Restore ECCS pump room boundary to OPERABLE status.	24 hours
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each ECCS PREACS train for ≥ 10 continuous hours with the heaters operating.	31 days
SR 3.7.12.2	Actuate each ECCS PREACS train by aligning Safeguards Area exhaust flow and Auxiliary Building Central exhaust flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.3	Perform required ECCS PREACS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.4	Verify Safeguards Area exhaust flow is diverted and each Auxiliary Building filter bank is actuated on an actual or simulated actuation signal.	18 months
SR 3.7.12.5	Verify one ECCS PREACS train can maintain a negative pressure relative to adjacent areas during post accident mode of operation.	18 months on a STAGGERED TEST BASIS

Attachment 4

(Serial No. 09-034)

Marked-up Technical Specifications Bases Changes

(For Information Only)

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)

B 3.7 PLANT SYSTEMS

B 3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

BASES

BACKGROUND

The ECCS PREACS filters air from the area of the active ECCS components during the recirculation phase of a loss of coolant accident (LOCA). The ECCS PREACS, in conjunction with other normally operating systems, also provides environmental control of temperature in the ECCS pump room areas.

INSERT 1

The ECCS PREACS consists of two subsystems, the Safeguards Area Ventilation subsystem and the Auxiliary Building Central Exhaust subsystem. There are two redundant trains in the Safeguards Area Ventilation subsystem. Each train of the Safeguards Area Ventilation subsystem consists of one Safeguards Area exhaust fan, prefilter, and high efficiency particulate air (HEPA) filter and charcoal adsorber assembly for removal of gaseous activity (principally iodines) (shared with the other unit), and controls for the Safeguards Area exhaust filter and bypass dampers. Ductwork, valves or dampers, and instrumentation also form part of the subsystem. The subsystem automatically initiates filtered ventilation of the safeguards pump room following receipt of a Containment Hi-Hi signal from the affected unit.

The Auxiliary Building Central exhaust subsystem consists of the following: three redundant central area exhaust fans (shared with other unit), two redundant filter banks consisting of HEPA filter and charcoal adsorber assembly for removal of gaseous activity (principally iodines) (shared with the other unit), and two redundant trains of controls for the Auxiliary Building Central exhaust subsystem filter and bypass dampers (shared with the other unit). Ductwork, valves or dampers, and instrumentation also form part of the subsystem. The subsystem initiates filtered ventilation of the charging pump cubicles following manual actuation.

The Auxiliary Building filter banks are shared by the Safeguards Area Ventilation subsystem and the Auxiliary Building Central Exhaust subsystem. Either Auxiliary Building filter bank may be aligned to either ECCS PREACS train. These filter banks are also used by the Auxiliary

(continued)

Insert

The charging/high head safety injection pump motors have internal fans that provide design cooling requirements without reliance on the central exhaust fans. The safeguards building has sufficient cooling capacity to ensure the associated equipment, Low Head Safety Injection (LHSI) and Outside Recirculation Spray (ORSP) pumps, remain operable for 60 minutes without the safeguards exhaust fans in service.

BASES

BACKGROUND (continued)

Building General area exhaust, fuel building exhaust, decontamination building exhaust, and containment purge exhaust.

One Safeguards Area exhaust fan is normally operating and dampers are aligned to bypass the HEPA filters and charcoal adsorbers. During emergency operations, the ECCS PREACS dampers are realigned to begin filtration. Upon receipt of the actuating Engineered Safety Feature Actuation System signal(s), normal air discharges from the Safeguards Area room are diverted through the filter banks. Two Auxiliary Building Central Exhaust fans are normally operating. Air discharges from the Auxiliary Building Central Exhaust area are manually diverted through the filter banks. Required Safeguards Area and Auxiliary Building Central Exhaust area fans are manually actuated if they are not already operating. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

The ECCS PREACS is discussed in the UFSAR, Section 9.4 (Ref. 1) and it may be used for normal, as well as post accident, atmospheric cleanup functions. The primary purpose of the heaters is to maintain the relative humidity at an acceptable level during normal operations, generally consistent with iodine removal efficiencies per Regulatory Guide 1.52 (Ref. 3). The heaters are not required for post-accident conditions.

APPLICABLE SAFETY ANALYSES

The design basis of the ECCS PREACS is established by the large break LOCA. The system evaluation assumes ECCS leakage outside containment, such as safety injection pump leakage, during the recirculation mode. In such a case, the system limit radioactive release to within the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 4) for alternative source terms. The analysis of the effects and consequences of a large break LOCA is presented in Reference 2. The ECCS PREACS also may actuate following a small break LOCA, in those cases where the ECCS goes into the recirculation mode of long term cooling, to clean up releases of smaller leaks, such as from valve stem packing. The analyses assume the filtration by the ECCS PREACS does not begin for 60 minutes following an accident.

The ECCS PREACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

elevated temperatures within the Safeguards Area, or in

BASES

LCO

Two redundant trains of the ECCS PREACS are required to be OPERABLE to ensure that at least one is available. Total system failure could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 4) for alternative source terms.

ECCS PREACS is considered OPERABLE when the individual components necessary to maintain the ECCS pump room filtration are OPERABLE in both trains.

Ventilation

An ECCS PREACS train is considered OPERABLE when its associated:

a. Safeguards Area exhaust fan is OPERABLE;

b. One Auxiliary Building HEPA filter and charcoal adsorber assembly (shared with the other unit) is OPERABLE;

c. One Auxiliary Building Central exhaust system fan (shared with other unit) is OPERABLE;

d. Controls for the Auxiliary Building Central exhaust system filter and bypass dampers (shared with the other unit) are OPERABLE;

e. HEPA filter and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and

f. Ductwork, valves, and dampers are OPERABLE.

Portions of ECCS PREACS may be removed from service (e.g., tag out fans, open ductwork, etc.), in order to perform required testing and maintenance. The system is OPERABLE in this condition if it can be restored to service and perform its function within 60 minutes following an accident.

In addition, the required Safeguards Area and charging pump cubicle boundaries for charging pumps not isolated from the Reactor Coolant System must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors, except for those openings which are left open by design, including charging pump ladder wells.

(continued)

BASES

LCO (continued)

The LCO is modified by a Note allowing the ECCS pump room boundary openings not open by design to be opened intermittently under administrative controls. For entry and exit through doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for ECCS pump room isolation is indicated.

APPLICABILITY

In MODES 1, 2, 3, and 4, the ECCS PREACS is required to be OPERABLE consistent with the OPERABILITY requirements of the ECCS.

In MODE 5 or 6, the ECCS PREACS is not required to be OPERABLE since the ECCS is not required to be OPERABLE.

ACTIONS

A.1

FOR REASONS OTHER THAN CONDITION B (FOR EXAMPLE, INSUFFICIENT VENTILATION EXHAUST FLOW RATE)

With one ECCS PREACS train inoperable, action must be taken to restore OPERABLE status within 7 days. During this time, the remaining OPERABLE train is adequate to perform the ECCS PREACS function.

THERE ARE BACKUP VENTILATION SYSTEMS FOR THESE ECCS PUMP ROOMS AVAILABLE TO PROVIDE COOLING AS NEEDED.

The 7 day Completion Time is appropriate because the risk contribution is less than that for the ECCS (72 hour Completion Time), and ~~this system is not a direct support system for the ECCS~~. The 7 day Completion Time is based on the low probability of a Design Basis Accident (DBA) occurring during this time period, and ability of the remaining train to provide the required capability.

WITH

~~Concurrent failure of~~ two ECCS PREACS trains ~~would result in the loss of functional capability; therefore~~, LCO 3.0.3 must be entered immediately.

INOPERABLE FOR REASONS OTHER THAN CONDITION C OR D,

INSERT D.1

If the ECCS pump room boundary is inoperable, the ECCS PREACS trains cannot perform their intended functions. Actions must be taken to restore an OPERABLE ECCS pump room boundary within 24 hours. During the period that the ECCS pump room boundary is inoperable, appropriate compensatory measures consistent with the intent of GDC 19 should be utilized to

(continued)

INSERT FOR PAGE B 3.7.12-4

ACTIONS

B.1.1 and B.1.2

With one ECCS PREACS train inoperable due to loss of its filtration capability, action must be taken within one hour to determine if the filtration capability is required. This is determined based on the Unit's operating parameter of "ECCS leakage". The value for "maximum allowable unfiltered ECCS leakage" is documented in the UFSAR (reference 6). If the current total ECCS leakage is less than the maximum allowable unfiltered leakage, then the filtration capability of ECCS PREACS is not required.

Action must be taken to restore the inoperable train to OPERABLE status within 60 days in order to restore the conservatism of full system capability. During this time, both trains remain operable to perform the ventilation exhaust function. (For example, a problem with the filter itself or its housing affects a single train, and both trains remain operable to perform the ventilation function using either the flow path of the remaining filter or the flow path of the bypass ductwork.) Also during this time, administrative controls are established to monitor operating parameters every 24 hours in order to determine whether or not filtration capability may become required. The 24 hour frequency is based on the low probability of a sudden change in ECCS leakage, and on the margin of safety included in the dose calculations. Sixty days is a reasonable time to return the filtration function to service due to the low probability of a DBA during this time, adequate ventilation exists, and the low probability of an increase in ECCS leakage to greater than the maximum allowable unfiltered leakage.

B.2

If total ECCS leakage is equal to or greater than the maximum allowable unfiltered leakage, then the filtration capability of ECCS PREACS is required, and action must be taken to restore Operable status within 7 days, consistent with Action A.1.

C.1 & C.2

With two ECCS PREACS trains inoperable due to loss of their filtration capability, action must be taken within one hour to determine if the filtration capability is required. If the current total ECCS leakage is less than the maximum allowable unfiltered leakage, then the filtration capability of ECCS PREACS is not required.

Action must be taken to restore an inoperable train to OPERABLE status within 30 days in order to restore the conservatism of full system capability. During this time, both trains remain operable to perform the ventilation exhaust function. Also during this time, administrative controls are established to monitor operating parameters every 24 hours in order to determine whether or not filtration capability may become required. The 24 hour frequency is based on the low probability of a sudden change in ECCS leakage, and on the margin of safety included in the dose calculations. Thirty days is a reasonable time to return one train of PREACS to service due to the low probability of a DBA during this time, adequate ventilation exists, and the low probability of an increase in ECCS leakage to greater than the maximum allowable unfiltered leakage.

BASES

ACTIONS

D ~~B~~.1 (continued)

protect control room operators from potential hazards such as radioactive contamination. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the ECCS pump room boundary.

E E
~~C~~.1 and ~~C~~.2

If the ECCS PREACS train(s) or ECCS pump room boundary cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Monthly heater operations dry out any moisture that may have accumulated in the charcoal and HEPA filters from humidity in the ambient air. The system must be operated ≥ 10 continuous hours with the heaters energized. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.2

This SR verifies that Safeguards Area exhaust flow and Auxiliary Building Central Exhaust subsystem flow, when actuated from the control room, diverts flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly for the operating train. Exhaust flow is diverted

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.2 (continued)

manually through the filters in case of a DBA requiring their use. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.3

This SR verifies that the required ECCS PREACS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorbers efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.4

This SR verifies that Safeguards Area exhaust flow for the operating Safeguards Area fan is diverted through the filters on an actual or simulated actuation signal. The 18 month Frequency is consistent with that specified in Reference 3.

SR 3.7.12.5

This SR verifies the integrity of the ECCS pump room enclosure. The ability of the ECCS pump room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested in a qualitative manner to verify proper functioning of each train of the ECCS PREACS. During the post accident mode of operation, the ECCS PREACS is designed to maintain a slight negative pressure in the ECCS pump room, with respect to adjacent areas, to prevent unfiltered LEAKAGE. A single train of ECCS PREACS is designed to maintain a negative pressure relative to adjacent areas. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 5).

This test is conducted with the tests for filter penetration; thus, an 18 month Frequency on a STAGGERED TEST BASIS is consistent with that specified in Reference 3.

REFERENCES

1. UFSAR, Section 9.4.

BASES

REFERENCES (continued)

2. UFSAR, Section 15.4.

3. Regulatory Guide 1.52 (Rev. 2).

4. 10 CFR 50, Appendix A.

5. NUREG-0800, Rev. 2, July 1981.

6. UFSAR, FIGURE 15.4-110